

# NATURAL RESOURCES CONSERVATION SERVICE

## CONSERVATION PRACTICE STANDARD

### Woodland Direct Seeding

(Interim)

(Acre)

Code 704

#### DEFINITION

Planting tree seed by hand or by mechanical means.

5. ashes
6. yellow poplar
7. black locust
8. black cherry
9. eastern white pine

#### PURPOSES

To establish a stand of trees to conserve soil and moisture, produce wood crops, and create wildlife habitat.

#### Site Preparation

Competition must be controlled during the establishment either by cultivation or herbicides. Refer to current Indiana weed control guide for recommendations.

#### CONDITIONS WHERE PRACTICE APPLIES

In open areas or in understocked woodland where the soils are suited to growing wood crops; where a site can be prepared; and where measures for protecting seed and seedlings can be provided.

If herbicides are used, apply them only when needed and handle with care. Follow all label directions and precautions. If herbicides are not handled or applied properly, they may be injurious to humans, animals, fish and wildlife, desirable plants, and pollinating insects, and may contaminate water supplies.

#### CRITERIA

##### Adapted Species

For trees and shrub recommendations by soils, consult the Windbreak Suitability Groups, Section II of the Field Office Technical Guide. Only the following species are recommended for direct seeding.

1. Virginia pine (south half of Indiana)
2. black walnut
3. native oaks
4. hickories

Heavy sod: Plow or disk on the contour before seed fall or seeding to expose mineral soil. On areas subject to erosion, plow or disk in strips, leaving alternating undisturbed strips that are wide enough to control erosion.

Woody cover: Remove competing cover mechanically or with approved herbicides. Scarify the surface to expose mineral soil.

Cropland: Generally no site preparation will be needed. A light disking operation may be

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

necessary to expose mineral soil and distribute crop residues.

### Seed Collection and Stratification

Seed should be obtained from commercial seed sources that have been involved with tree improvement programs or from sources collected within 100 miles of the seeding location.

If seeds are field collected, place seeds in porous bags to prevent heat buildup. Keep seeds cool. Stratify if necessary. Before stratifying:

1. Hull walnut and hickory seeds.
2. Soak pine and hickory seeds in water for 1 and 2 days respectively. Change water every day.
3. Scarify black locust seed mechanically or by soaking in sulfuric acid or boiling water.

To stratify and store seed, seal seeds in polyethylene bags. Do not put more than 25 pounds of seed in a bag. Inspect often, turn bags weekly, and maintain seed moisture content of 30-50%.

Refrigerate and place in cold treatment as shown below:

Species	Temp (°F)	Duration (Days)
red oak group	35-40	50-60
pin	35-38	30-45
black walnut	35-40	90-120
hickory	33-40	90-120
ashes	32-41	60-90
yellow poplar	35	45-90
black cherry	33-41	120

To eliminate unsound or hollow seeds before planting, place nut seeds in water. Discard seeds that float.

### Planting Dates

Seed may be planted from November through April anytime that soil and site conditions allow (do not seed into frozen soil). Spring seeding

can reduce rodent and insect damage. Fall seeding can eliminate the need for stratification.

All seed shall be stratified if planted after February. Acorns of most species in the white oak group have little or no dormancy and should be planted as soon as possible after collection in the fall.

### Seeding Rates

If there is an adequate mature tree seed source of desired species within 200 feet on two sides of the site to be planted, a rate of 700 acorns/nuts per acre for oaks and hickories for wildlife habitat development or wetland restoration may be used.

For other objectives, use the rates as shown in the seeding rates guide table for:

- a. timber production
- b. isolated sites (sites farther than 200 feet from a mature tree seed source of desired species on two sides); or
- c. increased production of food mast.

### Seeding Rates Guide

Species	Seeds /lb no.	Seeding Method			
		A.	B.	C.	D.
		- lbs/ac.			
eastern white pine	27000	.5	.5	.5	.5
virginia pine	55000	.1	.1	.1	.1
black walnut	40	76	76	38	38
white oak	120	26	26	13	13
red oak	125	24	24	12	12
black oak	245	12	12	6	6
shumard oak	100	30	30	15	15
ashes	16000	.6	.6	.5	.5
yellow poplar	14000	.6	.6	.5	.5
black cherry	4500	2	2	1	1
black locust	24000	.4	.4	.3	.3
swamp white oak	120	26	26	13	13
cherrybark oak	580	6	6	3	3
pin oak	410	7	7	4	4

Seed other oaks and hickories at a rate of 1500 viable seeds/ac.

A = broadcast (non-erosive sites)

B = strips (assumed to be 50% of total area)  
 C = spot (based on: pine-5x5 spacing, 5 seeds/spot, 1500 spots/ac; other-8x8 spacing, 2 seeds/spot, 750 spots/ac)  
 D = machine

If seed predation is a problem, the use of alternative feed attractants should be considered. Scatter shelled corn or similar grains in areas of the field with high predation potential.

### **Seeding Method**

Choose a seeding method that will be compatible with species being seeded and site characteristics. One of the following will be used.

Broadcast: Broadcast the seed evenly over the planting area and cover seeds with mineral soil (1/2 to 1 inch) using a light disk or harrow.

Strip: Broadcast the seed evenly over the prepared strips and cover seeds with mineral soil (1/2 to 1 inch) using a light disk or harrow.

Spot: Plant 2 to 5 seeds per spot, 2 inches deep. Use any of the following methods:

1. Hoe or mattock: Expose mineral soil and plant seeds. Firm soil over seed.
2. Heel method (soft ground only): Place seed on the ground and press it into the soil with shoe heel. Cover with mineral soil and firm with shoe.
3. Bar or pole (nuts only): Make a hole 2 inches deep with a sturdy pole or bar. Place nuts in the hole, cover with mineral soil, and firm with shoe.

Machine: Plant seeds 2-3 inches deep. Care must be taken to completely cover the seed and achieve good soil-seed contact. Specially modified planters are available for direct seeding. Bare-root seeding tree planters can also be used to plant nuts and acorns.

Natural regeneration: Natural regeneration may be used under the following conditions:

1. Areas that experience flooding of a frequency and duration that make plantings unlikely to succeed.
2. Depressional areas too wet to machine or hand plant.
3. Sites likely to be invaded by soft-mast species that would likely out-compete planted hard mast species.
4. Sites that are within 100 feet of existing mature woodlands and adjacent to desirable seed sources on two sides.

### **CONSIDERATIONS**

Generally, direct seeding has been less consistent than tree planting.

During site preparation and seeding operations, sediment yield and associated pollutant loads may be increased temporarily if the area is mechanically disturbed.

Where chemicals are used for site preparation or weed control, soluble pesticides and nutrients may be leached into soil and ground water or may be transported to the surface waters.

### **PLANS AND SPECIFICATIONS**

A woodland management plan is recommended. Plans and specifications are to be prepared for specific field sites. Plans and specifications will include construction plans, drawings, job sheets, construction specifications, narrative statements in conservation plans or other similar documents. These documents will specify the requirements for installing the practice, such as the kind, amount, or quality of materials to be used, or the timing or sequence of installation activities.

### **OPERATION AND MAINTENANCE**

Evaluate sites after the first growing season. Sites should be reseeded if stocking levels are below 60 percent of 1,000 seedlings/acre for pines and 500 seedlings/acre for hardwoods.

Protect the planted area from grazing. Refer to Use Exclusion (472). Fence only if necessary. Refer to Fence (382).

Protect the area from fire.

Competing vegetation should be controlled for a minimum of 3 years after seeding date.

Competitive vegetation may be controlled by mechanical or chemical means. Refer to current weed control guide for chemical recommendations.

If herbicides are used; apply them only when needed and handle with care. Follow all label directions and precautions.

## REFERENCES

*Forestry Handbook*; Society of American Foresters; Ronald Press; 1961.

*Seeds of Woody Plants in the United States*; Agriculture Handbook No. 450; USDA Forest Service; 1974.

*Seeding Shortleaf Pines in the Missouri Ozarks*; USDA Forest Service Research Paper CS-21; 1965.

*Oak Regeneration by Direct Seeding*; Alabama's Treasured Forests; Vol. 4, No. 3; 1985.

*Forest Planting Practice in the Central States*; Miscellaneous Release 34; USDA Central States Forest Experiment Station; 1962.

*Hardwood Nurseryman's Guide*; USDA Agriculture Handbook No. 473; 1976.